Successful Methods

CONSTRUCTION · ROAD MAKING · ENGINEERING · INDUSTRIAL · MINING

VOL. 2 MARCH 1920 No. 3

"SPRING TRAINING"

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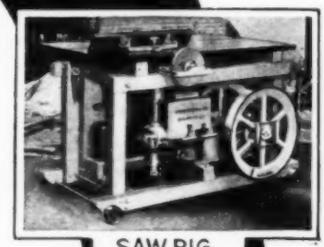
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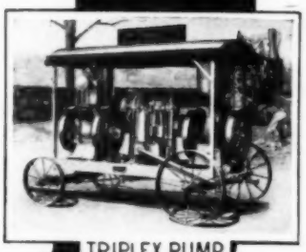
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Successful Methods

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"SPRING TRAINING"

It isn't spring yet. According to the calendar, that much-written-about season of budding trees, young men's turning fancies, and all that sort of thing is still several weeks away. Nevertheless our good friends the ballplayers are filling their particular corner of the newspapers with columns of talk and gossip about their spring training. They are heading for the South or the Pacific Coast for the purpose of limbering up their joints and fitting themselves for the pennant races. They don't wait for spring to come to them. They steal a march on the calendar in their pursuit of preparedness.

But what has all that to do with the contracting business? Just this. If you are a major league contractor or have hopes of becoming one, you are not waiting for spring to arrive before beginning your spring training.

To be sure, you cannot emulate the migratory ball player by taking your road roller down to Florida for a preliminary tuning up on a palm-shaded highway. But you ***can*** roll up the curtains and go over the whole machine thoroughly to see if it needs any repairs to fit it for the fray. You ***can*** inspect each and every piece of equipment in your storage yard to determine whether or not it will be ready when the word "Go" comes. You ***can*** take stock to see how many wheelbarrows need new handles, how many new shovels you will have to buy, how many new spare parts are required.

And how many new machines do you need? Have you gone into that question thoroughly? Remember that the manufacturers are behind in their deliveries now, and the spring freshets of orders will swamp them. What about your raw materials? Do you know where you stand on that question?

If this spring training already is under way, you are a big leaguer in your line. When the word "Go" comes you will be able to jump right in with both feet and make the dirt fly.

This Issue Has More Than 75,000 Circulation.

This Magazine Will Be Sent to Men Who Can Use It.

EDITORIALS

Getting Together

A FAMILY quarrel is one of the most disagreeable things in the world. Not long ago SUCCESSFUL METHODS discovered indications of such a dispute in its own household. One of its contractor-readers, who had been going through the resumé of the road building plans of the various states published in the January issue, remarked:

"What's the use in building roads when the state highway officials don't care whether you make money or not?"

There were other observations of the same tenor, so SUCCESSFUL METHODS got busy. A letter was sent to each and every state engineer in the country telling frankly what the contractor had said, and asking two questions, one in regard to the percentage of profit that a contractor might be expected to make on a road job and the other about the steps that had been taken to co-operate with contractors.

In this issue the replies from about half the states are printed. There was no room for more. The others will follow next month—that is, all which are received, and it is pretty hard to fathom the mind of the state engineer who would neglect such an opportunity to go on record on a question of such vital interest. The plain inference would be that so far as his state is concerned the remark which precipitated the whole discussion hits the nail on the head. And if there are any states where that view prevails the wise contractor will keep away from them.

There is little need to summarize on this page the replies thus far received. Those who are interested ought to read every letter printed. Some of them bring out points in favor of the contractor; others state the engineer's side in convincing fashion. But all of them show that the "Get Together" spirit is there, that it is seeking every opportunity to do its part in furthering the nation's great road-building problems.

"Get Together!" That's the keynote! The contractor and engineers are partners working side by side, shoulder to shoulder. They have a big job to do and if they stick together they can do it.

Revising Our Standards

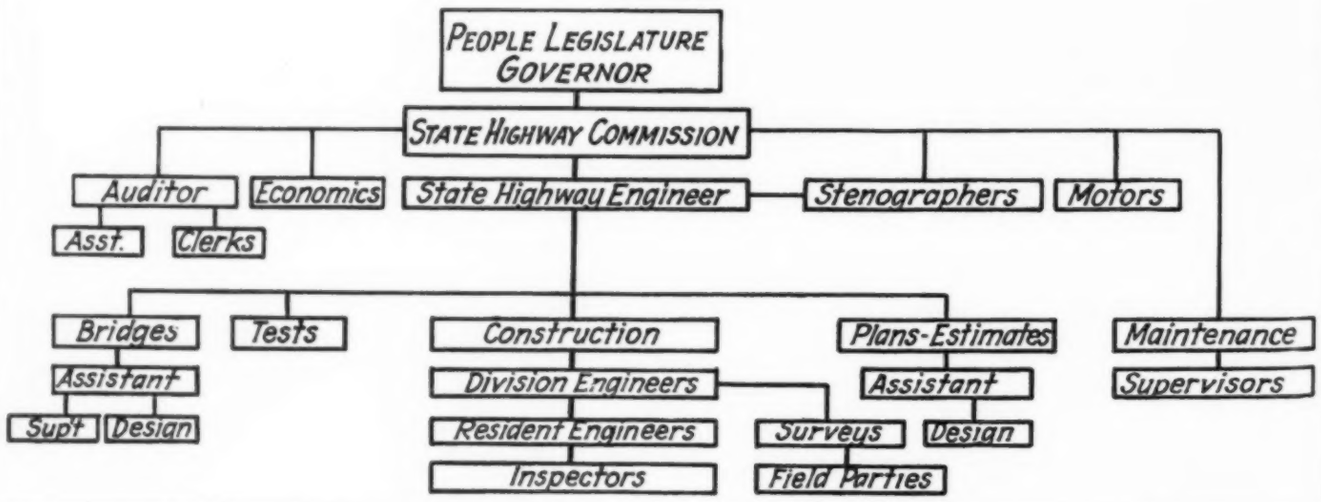
ONE of the speakers at the recent Good Roads Convention was discussing the labor question and remarked: "In the old days the workmen used to get together at noon or at the end of the day and boast to each other about how much work they had accomplished. Two gangs would almost come to blows in a discussion of which had done the bigger job during the day. But do you hear any of that talk now? Not a word. All they talk about is how much money they get.

"What we need is to change our standards, to go back to the old method. Not only the laboring man, but everybody, no matter what class he is in."

That sounds like good advice. To measure a man's value by the work he does instead of by what he gets for it, may sound somewhat old-fashioned, but there are plenty of old-fashioned ideas that are much to be preferred to modern notions.

Take this particular idea home and try it on yourself. Make the amount of work you do your standard. It might come about that as you increased the amount of work the size of your remuneration might keep pace with it. Stranger things than that have happened in this good old world.

How North Carolina Handles Its Road Work—A Typical Organization Chart of a State Highway Commission



An A. E. F. Job—The Nevers Cut-Off

American Equipment at Work in a Three-Fourths-Mile Cut. The French Engineers Said the Job Would Take Two Years, But the Americans Finished It in Four Months.

One of the Two Big Fills. This One Was Three-Fourths of a Mile Long and Averaged 35 Feet in Height.

Typical Units of the Force of Chinese Coolies Who Worked Under American Direction and Helped to Shorten the Bordeaux-Base-1-Route by 26 Miles.

Belgian Locomotive Hauling American Dump Cars. This Photograph Was Taken in the Early Stages of the Work. Later American Locomotives Were Used.

The Old and the New

That it doesn't take a trained engineer to build a serviceable suspension bridge the photograph at the top of the page clearly demonstrates. Even the denizens of the African jungle know how to get across a river if there are enough grapevines handy.

By way of contrast the picture at the bottom of the page shows a modern suspension bridge. The principle is the same, but the execution is different. The bridge shown is the Manhattan Bridge, the newest of the three suspension bridges across the East River between New York and Brooklyn.

In Bridge Building

During the war recourse often was had to primitive principles. A simple method of operating a lift drawbridge is shown in the upper picture. A number of British soldiers beside a French canal are holding down a joist which acts as a lever to lift the end of the bridge high enough to allow boats to pass.

At the bottom of the page is a photograph of the new Michigan Avenue bridge across the Chicago River now under construction. This bridge is the last word in lift or bascule bridge construction. It is a double deck affair and will carry roadways at two different levels.

ROAD MAKING AND MONEY MAKING

Cooperation Between State Engineers and Contractors Will Render Both Possible

(Believing that many contractors felt that they were not getting a square deal in highway work, SUCCESSFUL METHODS wrote to the various state engineers, stating the situation and asking them two questions. Here are the answers from more than a score of them. The others will follow next month.)

Alabama

ELIMINATING the speculative element from road contracting is the task which W. S. Keller, State Highway Engineer of Alabama has undertaken, and most contractors will wish him all success. With the luck element out, contracting would be a much safer business than it is today. Mr. Keller writes:

Editor, Successful Methods,

Dear Sir:

Replying to your letter of recent date, I wish to say that in my opinion a contractor to play safe during these strenuous times should figure on a profit of from 20% to 25%. I would not be understood as favoring a cost plus plan with such a profit added. In fact, I do not believe in the cost plus plan of doing work unless it is on the plan adopted in Massachusetts whereby the contractor furnishes teams and equipment at a stipulated sum per diem and receives a bonus for so much per cubic yard for earth moved or for other unit part of the work.

You ask what steps are we taking towards co-operation with contracfors. I wish to say that we are doing everything in our power to eliminate as far as possible any speculation that the contractor might have to take. In other words, we are making our plans and specifications as clear as possible and are securing the material with which the contractor is doing the work.

As you perhaps have noticed, our work heretofore has not been on a very large scale. Today the people of Alabama are voting on the issuance of $25,000,000 in road bonds, and it is conceded by every one that it will carry by a large majority. We expect to spend this fund at the rate of $2,000,000 annually, with a like sum as may be appropriated by the Government.

Yours very truly,

W. S. KELLER,
State Highway Engineer.

The Two Questions

1. What do you think is a fair percentage for the contractor's profit on a road job?
2. What steps are you taking toward co-operation with contractors?

Colorado

IF J. E. Maloney, Chief Engineer of the Colorado Highway Commission, could have his way, contractors would be protected against increases in freight rates.

Editor, Successful Methods,

Dear Sir:

Replying to your letter of recent date, will say that the first question as to the percentage for the contractor's profit on a road job depends upon many conditions; for instance, the size of the job and contingent risk. In my judgment it would be rather difficult to set one definite percentage as being fair on any one piece of work. I believe it might vary from 10 to 20 per cent net.

As to the co-operation with the contractors, the Commission has adopted a system of allowing the amount of premium on the bond on the first estimate in order to relieve the contractor of much financial risk. There is a clause by which the contractor is allowed 85% on any estimate on all materials furnished when same is delivered on the ground. As to the time limit, I believe that this should be extremely liberal on all contracts. I also think that a clause should be inserted in the contract which would guarantee the contractor against any raising of the existing freight rates upon materials furnished for any particular piece of work.

Yours very truly,

J. E. MALONEY,
Chief Engineer.

Connecticut

ALTHOUGH sympathizing with the contractor on some points, Charles J. Bennett, State Highway Commissioner of Connecticut, makes a firm stand against any letting down in quality in order to save the contractor's skin. The engineer in charge isn't always to blame. He has to keep to his standard in order to protect the public interest. More preliminary study by contractors is one solution of the problem in Mr. Bennett's opinion. His letter follows:

Editor, Successful Methods,

Dear Sir:

I have your letter with reference to the construction of roads.

You ask certain questions in that letter. Answering question 1, I think the contractor should be satisfied with a profit of 15% clear of all expenses.

2. This Department has endeavored and is attempting to co-operate with contractors so that they will secure fair prices for their work and on the other hand give good service for the money invested.

In general consideration of this matter I feel that some of the criticisms made by contractors of state highway departments are not fair. In general, when a contractor fails to make a success of a piece of work which he is doing under contract, he fulminates against the engineer, stating that the work has been unnecessarily delayed and that the engineer has been too strict in his interpretation of the specifications.

While I admit that many engineers are too much inclined to be insistent on small details, it must also be conceded that the class of road construction which has been performed in the past has not been of too high a character so that it is not possible nor wise for the engineer to give the contractor a chance to pull out even by allowing an inferior class of work.

My opinion of this whole matter is that the contractors on road construction do not give sufficient attention to their preliminary study of the problem at hand. They are too optimistic about the possibilities of performance. We should all be very glad to see contractors make a reasonable profit, but the highway engineers should not be blamed for all failures.

Yours very truly,

C. J. BENNETT,
State Highway Commissioner.

Delaware

NEW specifications have been prepared this year by Delaware's State Highway Department in an effort to let the contractor know just where he stands. Charles M. Upham, the Chief Engineer, asks in return that the rewritten specifications be studied carefully before bids are made. His letter:

Editor, Successful Methods,

Dear Sir:

We are much interested in the attempt you are making to clear up the misunderstanding between engineers and contractors.

In reply to your first question, we believe that a fair profit for a contractor on a road job is 10% net.

As to your question on co-operation with contractors, we would say that we are making liberal material estimates for all materials delivered. We also are making estimates

more frequently than has been the usual custom, and are making every effort to furnish experienced and competent inspectors to direct the work.

We have also rewritten our specifications for this year, and have attempted to make them as definite as possible in order that the contractor may know exactly what he must figure on. On the other hand, the engineers ask of the contractors careful study of the specifications that they may be able to make an intelligent bid which will allow them the profit which they demand.

Also it is necessary that contractors be men of experience in road work, otherwise, they will almost inevitably make bids below the cost at which they can carry on the work.

Very truly yours,

CHAS. M. UPHAM,
Chief Engineer, State Highway Department.

Indiana

CO-OPERATION between the State Highways Commission and a contractors' association is helping in highway work in Indiana. This method of getting together enables both sides to iron out difficulties in advance of the actual work, according to H. K. Bishop, Chief Engineer, who says:

Editor, Successful Methods,
Dear Sir:

Referring to your letter, I would say that I note what you say in regard to contractors and state work. It is a little difficult to answer the two questions which you ask, but I shall do so to the best of my ability.

1. It would seem to me that a fair percentage of the contractor's profit on any road job would depend more or less upon the size of the job. We use a profit of 15% and I believe that this should only be used after full allowance has been made for rentals of equipment, depreciation and overhead, such as insurance, telegraph, telephone, office rent, bond premiums, etc.

2. In the State of Indiana the contractors on road work have a Contractors' Association and we endeavor to confer with this Association from time to time and they with us, and adjust any matters that they think are not going to the best interests of the state and contractors in general.

We are often enabled by this means to correct certain matters which if allowed to stand might work to the disadvantage of the state and cost the taxpayers money.

Yours truly,

H. K. BISHOP,
Chief Engineer

Kansas

THROUGH the influence of the Highway Commission, the Kansas legislature recently passed a bill permitting payment for materials delivered on the job. This ought to help contractors by relieving them of the burden of tying up their money for too long a time. M. W. Watson, State Highway Engineer, says:

Editor, Successful Methods,
Dear Sir:

In reply to your letter concerning co-operation between the state highway departments and the contractors, I beg to advise that this department has always tried to co-operate with the contractors to the fullest extent.

In answer to your question, I beg to advise as follows:

1. I believe under present conditions that a fair allowance for profit to the contractor is 15%.

2. We have procured the passage in the recent legislature of a bill permitting payment for materials delivered on the work, which will relieve the contractor of carrying such a large expense for a considerable length of time. This department at all times tries to determine the conditions which the contractors feel are working to their disadvantage and wherever possible these conditions are being corrected.

Very truly yours,

M. W. WATSON,
State Highway Engineer.

Kentucky

A HARDSHIP which has made the path of the contractor in Kentucky harder than it ought to be is being attacked by W. N. Bosler, Road Engineer of the Department of Public Roads. The law requiring a contractor to put up a bond equal to the amount of the contract will be repealed and only 20% will be required, if Mr. Bosler's plans meet with favor in the legislature. He says:

Editor, Successful Methods,
Dear Sir:

Please be advised that this department is very desirous of having successful contractors handle the construction work. We are endeavoring to make payments more promptly to the contractor and we desire to allow him a profit of 20%.

We also are endeavoring to make the matter of furnishing bond more equitable than it has been in the past, under which arrangement we required the contractor to put up bond equal to the amount of the contract. This, we hope to have changed by legislative action to require the contractor to put up a 20% bond. This, as you see, will be a material saving to the contractor.

Yours very truly,

W. N. BOSLER,
Road Engineer.

Maine

IF FREIGHT rates are increased while you are engaged on a roadbuilding job in Maine, the increase will be allowed. This allowance will not stand, however, says Paul D. Sargent, Chief Engineer of the State Highway Commission, when the time of a contract is extended and the freight rates are increased after the date originally set for completion. He says in his letter:

Editor, Successful Methods,
Dear Sir:

In answer to the questions of your recent letter:

1. I would say from 10 to 15% on the net cost of a job would be a fair profit to the contractor. If the job were very small the percentage might properly run higher than 15. It might go as high as 20 to 25%. We strenuously object, however, to profits of 40 and 50%, which all bid prices in the last three years, compared with the actual cost of the work, have indicated. My reason for making this statement is that jobs which we have advertised for bids and upon which bids have been received have later been done on force account or cost plus basis. In several instances the cost plus jobs after paying all of the bills in connection with the work and paying the contractor for his equipment and 10% profit on all bills have shown a saving of 30% over the original bid price.

2. We shall agree with contractors that in case any increase in freight rates occurs during the life of their contract, we will allow them such increase. We do not plan, however, to stand by this agreement in case it is necessary to extend the time of the contract and the increased freight becomes effective after the date of completion called for in the contract.

Yours very truly,

PAUL D. SARGENT,
Chief Engineer.

Minnesota

CONFERENCES with contractors and contractors' associations are helping to promote co-operation in Minnesota, according to John H. Mullen, Chief Engineer, who reports that there is a good spirit on both sides in his state. He says:

Editor, Successful Methods,
Dear Sir:

Your letter of recent date to Mr. Babcock was referred to me, but I would rather not at the present time make a public statement on what I think is a fair percentage for contractors' profit on a road job.

This department is co-operating with contractors by having conferences with the contractors themselves and representatives of their associations on matters which we are both interested in, such as the form of specifications and contracts, the selection of materials, etc. There appears to be a good spirit of co-operation shown on both sides in this state.

Yours very truly,

JOHN H. MULLEN,
Chief Engineer.

Montana

OUT in Montana, J. N. Edy, Chief Engineer of the State Highway Commission, plans to hold a convention of contractors and highway officials at which requirements and specifications will be discussed. His letter:

Editor, Successful Methods,

Dear Sir:

Your communication has been received. In reply to No. 1, I would say that from 10 to 25% should be allowed depending upon the size of the contract and the equipment required to do the job.

Replying to question 2, advise that the commission has modified and revised the specifications in such a manner as to eliminate all ambiguities and to cheapen the cost of work to the contractors. Further, we are analyzing costs of several operations on the more important projects as a basis for our preliminary estimate and last, but not of least importance, in the matter of co-operation we are arranging to hold a convention of contractors at which time the provisions of the specifications will be generally discussed and an opportunity afforded the contractors to learn just what will be expected of them in the matter of finished jobs, etc.

Yours very truly,

J. N. EDY,
Chief Engineer.

Nebraska

SUGGESTIONS made by the contractors at conferences called by George E. Johnson, Secretary of the Nebraska Highway Commission, have resulted in reducing the cost of work. That statement shows that co-operation pays. Mr. Johnson writes:

Editor, Successful Methods,

Dear Sir:

In answer to your question No. 1, we make all of our estimates based on allowing the contractor a net profit of 20%.

I have adopted the policy of calling the contractors together from time to time and getting their views as to what can be done to assist them in handling their work more economically. By such co-operation we have a better feeling between the contractors and the Department and have also been able to reduce the cost of work by following out some of the suggestions of the contractors.

Yours very truly,

GEORGE E. JOHNSON,
Secretary.

New Hampshire

WHEN imported material is used on New Hampshire roads the State usually pays for it and the contractor's money is not tied up in the purchase price. In his letter F. H. Colburn, Assistant State Engineer, goes into the contractor problem thoroughly and every word of it is worth reading whether or not the reader is interested in New Hampshire jobs. The letter:

Editor, Successful Methods.

Dear Sir:

Realizing that there is a feeling in the minds of contractors that they are abused by various state highway departments, it gives me a good deal of pleasure to be able to state our views on the subject.

It is the earnest endeavor of the New Hampshire State Highway Department to co-operate in every way possible with a contractor employed on its construction work. Our inspectors have been instructed to co-operate in every way, giving all the aid possible to the contractor, and in any case of an interpretation of specifications to be as liberal with the contractor as will be consistent with proper road construction. An inspector's authority does not exceed the minor details of interpretation, but these minor details may be of a good deal of help or hindrance to the contractor, according to which way they are interpreted.

However, this help given to contractors does not mean that the provisions of the contract on which the contractor bids are to be ignored, neither are they to be changed because the contractor feels some other method more economical for him may be used. Before a contractor submits a bid the specifications may be seen and studied by him and there is no reason why he should anticipate that changes might be made later. I speak of this because on one or two of our contracts, the successful bidder, as soon as the contract was awarded him, requested that certain changes be made, as he felt that he could not carry out the terms of the contract under the unit prices submitted.

This method of bidding is not only unfair to the state, but also unfair to contractors who have submitted bids on the face value of the specifications. We, of course, reserve the right to award the contract to the lowest reliable bidder, but it is often the reliable bidder (from a financial standpoint) that makes this request.

In practically all our contract work where imported material is used the state buys this material and the contractor assumes liability at point of destination. This is a help to the contractor in so far as his money is not tied up in the purchase price of the material.

You ask what is considered a fair percentage for a contractor's profit on a road job. In making up our engineers' estimate we, as a general rule, allow 20% for contractor's profit. This varies, of course, according to whether the contract is all labor or whether a large amount of material must be purchased by the contractors.

Yours very truly,

F. H. COLBURN,
Assistant State Engineer.

New Mexico

DOWN in New Mexico the State Highway Commission helps out the contractor by obtaining surfacing materials free of cost to the contractor, spotting the pits on the plans, and guaranteeing quantity and quality. On items such as metal culverts and cement the Commission uses its influence to get such materials for the contractor at the lowest market price. L. A. Gillett, State Highway Engineer, says:

Editor, Successful Methods,

Dear Sir:

Answering your question as to what is considered a fair percentage of profit for the contractor on a road job, that point depends largely upon the size, character and local conditions of the job.

On jobs of substantial mileage of concrete construction we figure 15% to the contractor, which covers profit, bond, employes' indemnity and contractor's overhead and use of equipment. This is in instances where the money involved is large and in our state the working time long. Therefore, the turnover on capital invested is quick. We pay full amount of estimated completed work of the different units involved in the contract, less 15% monthly.

On jobs of small size financially, and of lower types, such as gravel surfaced roads, we figure profit is from 15% to 20%, including the above items and depend on local conditions, labor, time, etc.

As to the matter of co-operation with contractors, most of the road work on our program is gravel surfacing and water bound macadam and all materials for the same are furnished in pits adjacent to the rights of way. In this class of work there is little co-operation between the state and contractor in regard to furnishing material, transportation, etc.

On all of our jobs we obtain the surfacing materials in the pits free of cost to the contractor and spot the pits on our plans and guarantee the quantity and quality of the materials. As surfacing is the biggest item and the only one on this type of road where there is any question of results, this method is an absolute guarantee to the contractor and the best cooperation possible.

We are also offering to the contractors the use of trucks obtained from the War Department for haulage purposes on an equitable rental basis.

On items of metal culverts and cement necessary in the job, we use every effort to obtain the lowest market price for the benefit of the contractor and obtain guarantees from the supply houses of such prices for certain specific jobs, hence on all our contracts the contractor can figure on a definite basis of cost for materials. This last is also true of bridge timbers and supplies which go into every job.

Yours very truly,

L. A. GILLETT,
State Highway Engineer.

ONE OF CONNECTICUT'S "QUALITY' ROADS

New York

FRANKLY admitting that in the past highway contractors have not had much encouragement, Frederick Stuart Greene, Commissioner of Highways of New York, insists that he is doing everything in his power to remedy such conditions. On another page appears an excerpt from a circular sent out by Mr. Greene to all county officials. Both the circular and his letter show that Commissioner Greene wants to co-operate with the contractors. He says:

Editor, Successful Methods,

Dear Sir:

There is good ground for highway contractors to say that in the past they have not been given much encouragement. It has been stated by conservative men that for every dollar spent on roads in this state, it has cost the contractors $1.10 to do the work, and certain it is that in looking over our past records there would seem to be some truth in this statement for many contractors have become financially embarrassed who undertook to build our roads, and no one would put himself in this position unless forced into it. As soon as I took office I announced that I was in favor not only of giving the contractor a square deal, but of giving him the benefit of every doubt, as he was the party to the contract who was taking the long risk.

I am glad to say that out of a total of 360 projects which this commission has put to work since I took office, we have not as yet had a single cancellation and the contractors report that they are making a fair profit.

Answering your questions directly:

1. In making up our estimates we try to get at the exact cost of the work, and to this we add 20%, which might be divided as 5% overhead expense and 15% profit. My experience is that any contractor who bids less than 15% as his job profit will sooner or later find himself in financial difficulties owing to the many unforeseen contingencies which arise on every contract.

2. We are doing everything in our power to co-operate with the contractors. Not only is this true in our own office, but we are asking the county officials to co-operate and also trying to interest the citizens residing along any road which is being constructed.

Very truly yours,
FREDERICK STUART GREENE.

North Dakota

PLAYING fair with the contractor is one of the principles under which the North Dakota Highway Commission works. Furthermore, W. H. Robinson, Chief Engineer, says his state is fourth among the states of the Union in the number of miles of Federal Aid projects for which agreements have been executed. He writes:

Editor, Successful Methods,

Dear Sir:

The press of other work makes it difficult to reply to your letter at great length, but rather than wait too long we had decided to write you briefly, believing that that would be more acceptable to you.

As far as this state is concerned, there is a scarcity of reliable contractors to undertake our state highway work and this scarcity will be more pronounced in the near future.

Your attention is called to the fact that while this department is a relatively new department its Federal Aid activities have been sufficiently great so that North Dakota stands in fourth place among all the states in the union as to the number of miles for Federal Aid projects for which agreements have been executed.

Unfortunately, the conditions in the counties in the past have been such that we are building principally earth roads with a small percentage of gravel at an average cost of about $3,000 per mile or less. On this account it is unlikely that out-of-state contractors will be attracted to our state, although we have some of these contractors and expect to receive bids from others.

We have a list of all contractors who have corresponded with the department, to whom we send out regularly notice of all lettings.

Our specifications and contracts are drawn up with a view to playing fair with the contractor. Recently we have inserted a provision in the contract whereby the contractor is protected in case freight rates increase after submitting of his bid.

In addition, it is the policy of this department that a "live" contractor who has made a reasonable profit upon our work is worth a great many "dead" contractors, who have been driven to the wall by a too rigid set of specifications or enforcement of the same.

We believe that every man is worthy of his hire and that the contractor is entitled to a reasonable return upon his investment and his time. Just what this percentage may be is difficult to say, because the gross sum bids submitted by contractors are not always determined upon the same basis. Properly conceived, where the bidder takes into account all of the overhead charges and includes all personal services, etc., it is our thought that the net profit should not exceed 10%.

In closing I would like to repeat that our department is committed to the policy of the square deal to the contractor as long as he does acceptable work and plays fair with us.

Yours very truly,
W. H. ROBINSON,
Chief Engineer and Secretary.

Ohio

ONE difficulty under which the average state engineer labors and which many persons, contractors included, are inclined to overlook is pointed out by H. D. Bruning, Chief Highway Engineer of Ohio. There are a number of ways in which he would like to make the contractor's work easier, but as he puts it, state highway officials are "creatures of the law" and are not always permitted to be as generous as they would like to be. He says:

Editor, Successful Methods,
Dear Sir:

In answer to your two questions I beg to offer the following:

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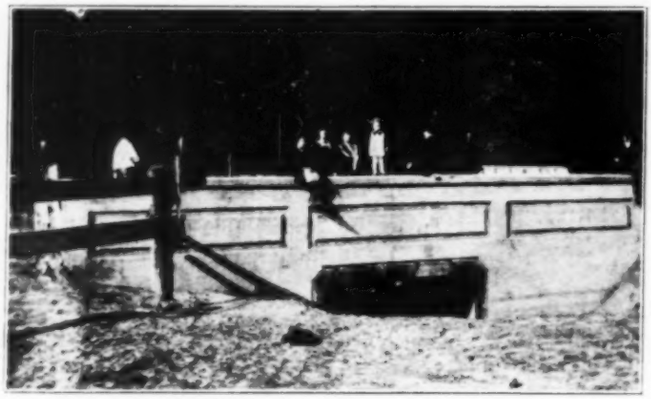

A KENTUCKY CONCRETE CULVERT

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Chief Highway Engineer.

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Ohio

ONE difficulty under which the average state engineer labors and which many persons, contractors included, are inclined to overlook is pointed out by H. D. Bruning, Chief Highway Engineer of Ohio. There are a number of ways in which he would like to make the contractor's work easier, but as he puts it, state highway officials are "creatures of the law" and are not always permitted to be as generous as they would like to be. He says:

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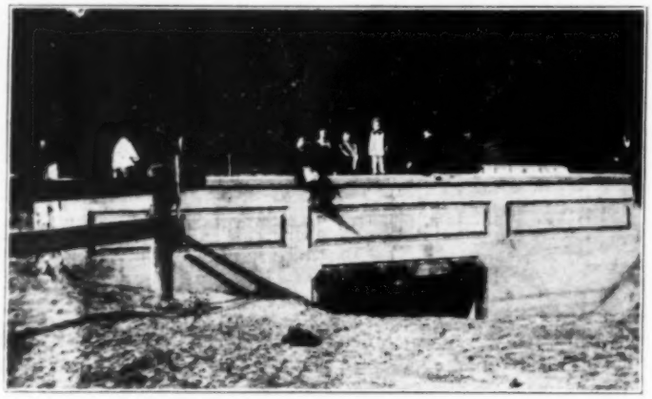

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A BUILDER OF THE NATION'S GRANARIES

W. R. Sinks, Known Far and Wide as the Father of the Modern Concrete Elevator

THOSE who consider themselves tolerably familiar with the subject are wont to call William R. Sinks the "father of the concrete grain elevator." William R. Sinks seems to be about the only dissenter. He modifies the statement to this extent.

"If you will call me the father of concrete elevator building with a slip form," he says, "I'll stand for it."

Inasmuch as practically every concrete elevator in these United States and the neighboring Dominion of Canada was built by the use of movable forms, Mr. Sinks seems to be drawing a pretty fine distinction, but on the other hand, he speaks from no mere acquaintance with his subject, but from a knowledge gained in 35 years of close association with it, so there isn't much to do but to accept his reservation.

W. R. SINKS PAUSES DURING A BUSY AFTERNOON IN HIS CHICAGO OFFICE TO LET THE PHOTOGRAPHER TAKE HIS PICTURE.

This article was meant to be the usual sort of biographical sketch, but Mr. Sinks wouldn't have it so. He was willing to talk concrete elevators by the hour, but dodged questions about himself. Luckily he has been so closely associated with the development of the concrete elevator that the story of one is the story of the other, so his modesty regarding his achievements fails in its purpose this time.

According to Mr. Sinks, the old wooden grain elevators were all right until they burned up, which they did with a frequency that was disappointing, discouraging and costly. The explosive character of the grain dust made them the worst sort of fire hazards and every builder was looking around for a satisfactory fireproof grain elevator.

It was in those days that Mr. Sinks, then about 22 years old, went to work for Barnett & Record, contractors of Minneapolis, specializing in building elevators. Born in Ohio, he had succumbed to the "Go west, young man, go west," of Horace Greeley, and at the conclusion of a visit to a sister in Wisconsin decided to go a little further West, selecting Minneapolis as his objective. Once there he engaged in the building business and it was at the conclusion of a season in which he had completed successfully a number of sub-contracts for Barnett & Record that he was hired by that firm as its general superintendent.

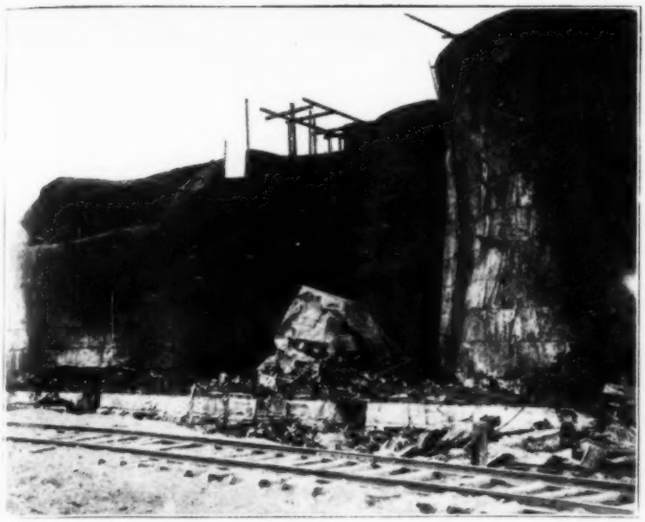
Steel elevators were becoming fashionable about that time. Hailed as the solution of the fireproofing problem, they were built in great numbers until someone made an alarming discovery. True, the steel didn't burn, but if a fire came anywhere near a steel elevator its walls grew so hot that they set fire to the grain inside. The result of such a mournful incident is clearly shown in one of the photographs on the opposite page.

The ruin of the grain inside various steel elevators as a result of fires in the neighborhood spelled the doom of that form of construction and the elevator men began to look for something better. The tile elevator next was developed, a form of building which Barnett & Record specialized in for a number of years. The firm controlled the basic patents and after the first one put up in Minneapolis had proved successful, the demand for them became so great that about 15,000,000 bushels of elevator space per year were put up.

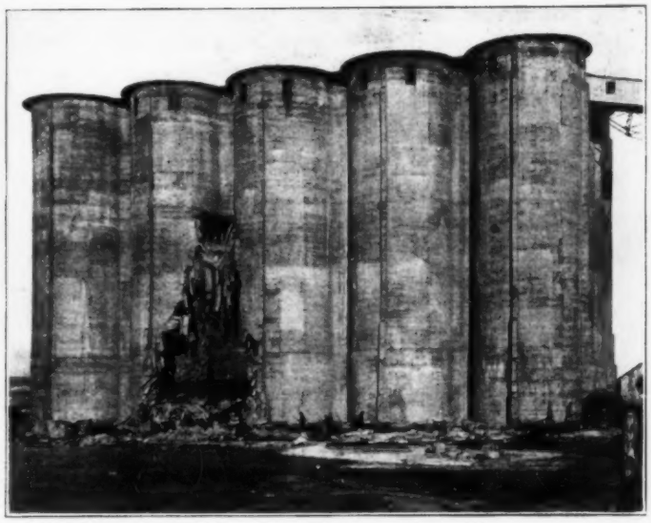
The great problem seemed solved so far as the firm of Barnett & Record was concerned, but others didn't think so. One of these others was a man named Haglin, who, according to Mr. Sinks, deserves the credit of being the first man to build a concrete elevator in this country. This pioneer of the modern grain elevator was put up in Duluth. It was built with fixed forms which were taken off and raised after the concrete had been allowed to set overnight. The result was an unsightly job with each joint plainly marked and with considerable offset every now and then. Unsightliness was not the only defect of the first concrete elevator, for the first time it was filled with grain it burst open.

That was a black eye for the concrete elevator right at the start of its career, and if it hadn't been for a man named Henry, who was chief engineer of the Canadian Pacific Railway, that black eye might have kept the concrete elevator from coming into its own for many more years.

This Canadian engineer certainly deserves the title of godfather of the concrete elevator, "built with slip forms," to use the Sinks phraseology. His railway needed a half million bushel elevator at Port Arthur and it was his job to get it built. Several years before, while traveling in Central Europe, he had seen some small concrete elevators and had fallen in love with them. So when he began negotiations for the Port Arthur elevator he asked why it shouldn't be built of concrete.



WHAT A FIRE ACROSS THE STREET DID TO A STEEL GRAIN ELEVATOR



THE FIRST CONCRETE ELEVATOR. IT BURST AFTER BEING FILLED WITH GRAIN

Barnett & Record with their patented tile elevator tried to discourage him, but he was obdurate. Even a reference to the Duluth fiasco failed to move him and he asked that bids be submitted for three types of elevator, steel, tile and concrete. His wishes were law, so Barnett & Record proceeded to submit three bids, but before doing so "bethought themselves of a stratagem," as the Swiss Family Robinson always phrased it. Knowing from their investigations and data that a concrete elevator could be built for less than a tile structure, they calmly made a higher price for concrete than for tile. Mr. Sinks confesses to a part in this ingenious plan, but in the same breath admits he is glad it didn't work.

For it didn't. Mr. Henry looked over the bids, refused to let a little thing like a few thousand dollars worry him, and accepted the bid for the concrete grain elevator. That puts things squarely up to Barnett & Record, and incidentally to Mr. Sinks. At this point, Mr. Henry contributed a most useful hint also gleaned from his travels. While on the other side of the Atlantic he had observed the construction of a concrete culvert on which movable forms were used which were drawn forward with a sort of capstan as fast as the concrete was poured. During a conference on the new elevator he told what he had seen. That was enough to start Mr. Sinks.

"If a movable form can be used on a concrete pipe lying on its side in an earth obstructed trench," he said, "why isn't it easy to make one that can be pushed up into the empty air as fast as we build our elevator?"

Convinced that the thing could be done, it didn't take him long to devise the movable form with its yoke and jack working on a steel rod set in the concrete which has been used ever since in one form or another whenever concrete grain elevators have been built.

The new device made the Port Arthur job easy, and

A MODERN CONCRETE GRAIN ELEVATOR WITH A CAPACITY OF 1,100,000 BUSHELS. BUILT AT PHILADELPHIA FOR THE PENNSYLVANIA RAILROAD BY JAMES STEWART & CO., UNDER THE DIRECTION OF MR. SINKS.

the profit was about $30,000. That was finished about 1904 or 1905, and in the intervening years since, concrete elevators have gone up wherever there was grain to put in them. A 200-ft. elevator can be put up in 6 weeks and to the eye the walls will be as smooth as a cathedral column. All this, thanks to Father Sinks and the movable form, not forgetting Godfather Henry of the C. P. R. and the less fortunate pioneer, Haglin, whose relationship is a little harder to define.

Mr. Sinks remained with Barnett & Record for 20 years, finally becoming manager. Fifteen years ago he joined the James Stewart contracting organization as head of its grain elevator department. In the 35 years he has been in the business he has built on an average of 5,000,000 bushels of elevator space per year and is still at it. Just at present he is full of enthusiasm over the big elevator for the Pennsylvania Railroad at Baltimore, which will be finished this month.

"It is one hundred years ahead of the times," is the way he describes it, and he ought to know. But that's another story for which the readers of SUCCESSFUL METHODS will have to wait.

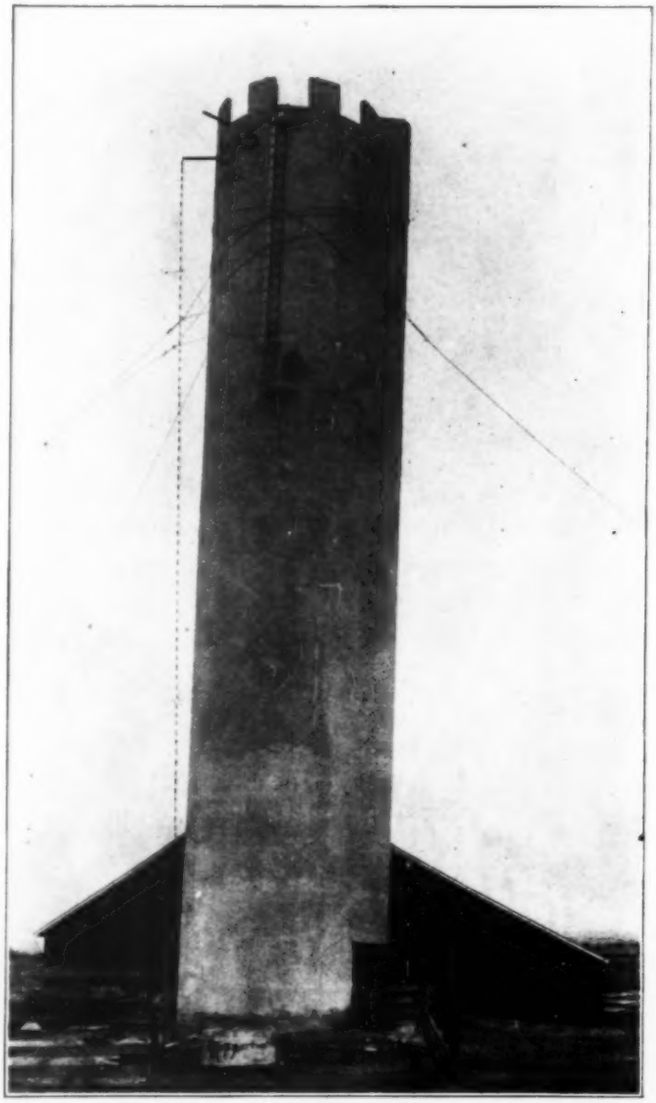
STRAIGHTENING UP A LEANING SILO

Bringing it Back to Perpendicular From a Variation of 46 Inches

ON the farm of E. J. Ozias, Center View, Mo., a Polk System silo and water tower had been constructed. Due to some irregularity in the width of the foundation ring, also to the added weight of the chute on one side, it began to lean and went over until the top was 46 in. out of perpendicular.

The tower had an inside diameter of 16 ft. and was 80 ft. high with a 16 by 24 ft. water tank in the top. The foundation went 3½ ft. into the ground and the first thing the contractor did, after firmly fastening his guys around the top of the tower and thus anchoring it, was to dig a trench some 3 ft. and 9 in. deep half way round the tower and on the high side. This trench went down just enough below the bottom of the foundation to give the workmen good auger room.

He next bored a series of 2-in. holes, about 2 ft. apart, toward the center of the base under the foundation; then gave the silo some hours to begin to come back to plumb. Later he bored another series of holes half way between those of the first series, thus making a complete ring of 2-in. holes 1 ft. apart and extending half way round the silo under the foundation of the high side. It took the silo approximately three days to settle back gradually into a perpendicular position.



WHEN WORK BEGAN. SHOWING ROPES ATTACHED TO SILO PREPARATORY TO HELP PULL IT STRAIGHT POSITION OF GUYS WHEN READY TO MOVE

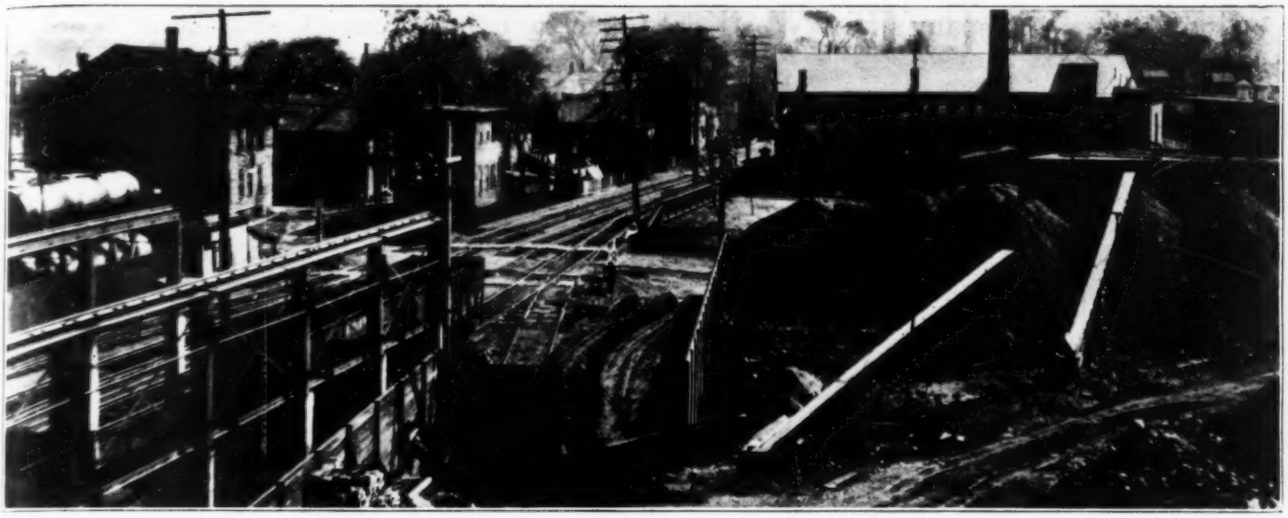
The next thing was for him to devise a way to hold it firmly in this position—that there might be no future leaning.

He, therefore, fastened a series of 1 in. deformed brace bars into shoulder holes in the silo wall, letting the top of the brace bar come 6 in. below the grade level, and the bottom extend out 3 ft. Thus the bar stood at an angle of 45°. These brace bars were placed every 12 in. on the silo wall, extending entirely around it. A couple of ring bars, of similar material, were put over the brace bars — one 6 in. up from the bottom, the other 6 in. down from the top. This reinforcement then was filled in with concrete.

When this was completed the silo not only stood plumb, but it had an added bearing in the new foundation which held it in perfect position: and all for an approximate cost of $150.

Many silos are built with insufficient foundation, as this one was, but the ingenuity of the contractor remedied the deficiency in a comparatively short time and at an extremely moderate cost. That sort of contractor is well worth having in almost any neighborhood.

COAL STORAGE AND RECLAIMING BY MACHINERY



CONVEYORS PILING THE COAL

THE United Electric Co. of Springfield, Mass., used to store their coal at Indian Orchard, several miles from the plant. Here it was unloaded by a steam shovel and then later reloaded and switched back to the plant.

To eliminate this waste they installed two portable belt conveyors and a little later a third machine was added. The photograph at the top of the page shows this combination at work on some waste land right at the plant. A clamshell bucket suspended from an overhead track unloads the cars, depositing the coal into a wooden bunker. From this bunker a chute runs to the first conveyor and the coal runs by gravity on to the moving belt. The three conveyors operate in series, chutes leading from the discharge end to the hopper of the next machine.

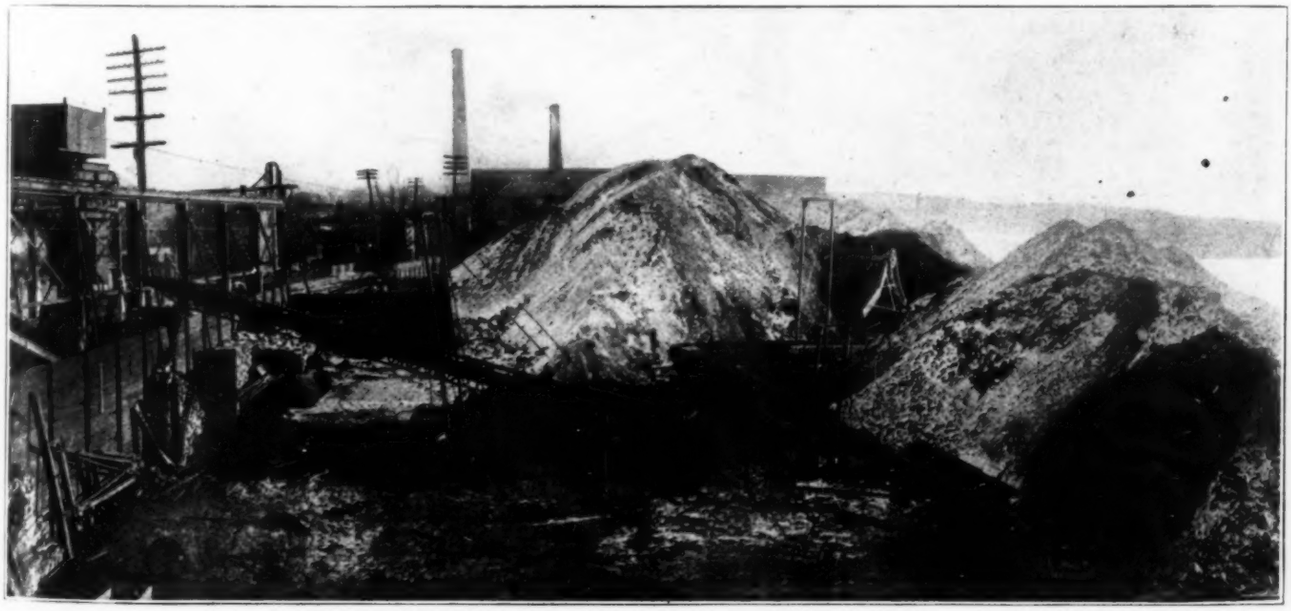
With this equipment about 15,000 tons of coal were stored in the conical piles by only one man at a cost of but a few cents per ton. The old method cost about $2.25 per ton and the company figures that this installation has saved them at least $20,000 in less than a year.

The picture at the bottom of the page shows the same equipment, with a self-feeding bucket loader added, at work reclaiming coal from these storage piles. Here the operation is just reversed, final delivery being made to the boiler house in place of the cars.

The bucket loader is cutting a channel through the center of the piles, feeding the first conveyor which in turn feeds the others, finally delivering the coal to the stationary belt conveyor leading into the power house.

The short conveyor in the right foreground was used to clean out a spot of hot coal by backing the hopper end into the pile and shoving the coal on to the moving belt. Later when the loader has eaten a little further into the pile this machine was added to the series and the entire storage cleaned up without the aid of wheelbarrows or shovels.

One man operates all the machines and the total cost of reclaiming at the rate of over a ton per minute is his wage plus a small item for electric power.



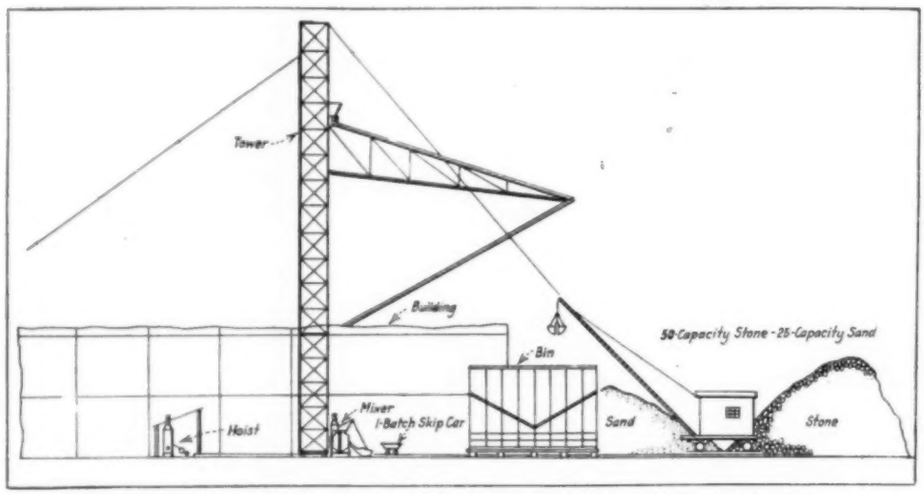
THE RECLAIMING PROCESS IN FULL SWING

A MOVABLE MIXING PLANT

How Texas Company's Pier Was Kept Open to Traffic During Construction Work

By R. M. Gates

TO put up four buildings each 125 ft. long by 75 ft. wide on a 700-ft. pier and at the same time keep the pier in almost constant use was the problem that confronted the Texas Oil Company at its waterside station at Bayonne, N. J. The necessity of keeping the traffic moving while the construction work was in progress restricted the working room allotted to the mixer at any one time to about 160 sq. ft., and in order to overcome the difficulty thus created it was decided to move the tower and mixing plant along one side of the building as the work progressed.

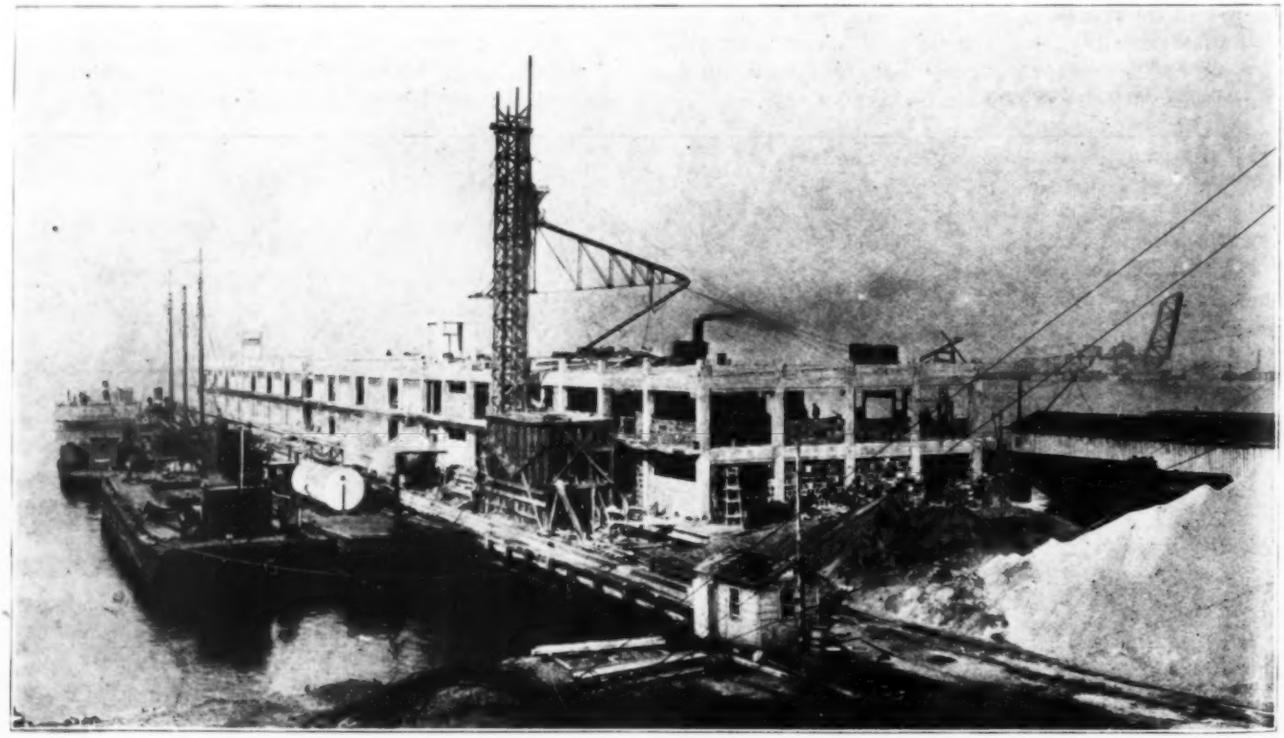


SKETCH OF PLANT, INCLUDING HOIST, TOWER, MIXER AND BIN

The mixing plant and tower are shown in the first sketch. The complete plant, including hoist, tower, mixer and bins, was moved three times, each time a distance of 140 ft. The operation of moving to the various locations was conducted in the following manner:

As may be noticed in the photograph, a track was run along the side of the building, the storage bin and tower being built on skids which rested on the track. Under these skids 6 by 6 in. timbers were placed. The first step in moving was to haul the mixer away from the tower into the clear, a job which was done with a hoisting engine. The bin was then jacked up, the 6 by 6-in. timbers removed and steel rollers put in their places. The hoisting engine was then employed to pull the bin into a position tight against the tower. The first section of chute was then lowered and fastened to the outer end of the bin so that it would act as a strut.

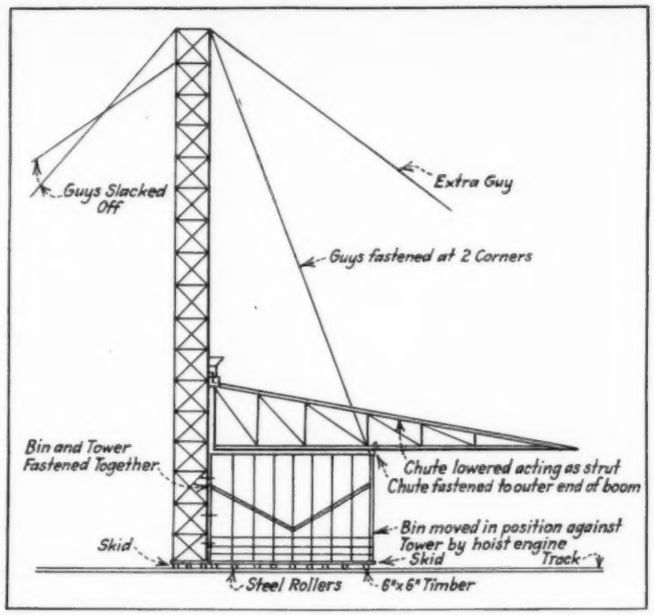
The guys on the same side of the tower as the bin were then fastened to the outside corners of the bin, as shown in the second sketch. The guys on the other cor-



GENERAL VIEW OF PIER, SHOWING TRACK ON WHICH PLANT WAS MOVED

ners of the tower were slacked off and an additional guy was added, and kept taut as the plant was pulled along. The superintendent in charge said, however, that he thought the operation could be carried out successfully without the use of this additional guy. An engine was attached to the end of the bin, the bin and tower being tied together and the whole plant was then dragged down the track on the rollers.

From the time concreting stopped on one building until it was begun again with the mixing plant in position on the next building, only a period of two working days of eight hours each had elapsed.



POSITION OF GUYS WHEN READY TO MOVE

The pier was 700 ft. long and 111 ft. wide. In constructing the four buildings about 2,500 cu. yd. of concrete was used.

The plan of moving the entire apparatus from one building to another achieved the result for which it was designed. All through the period during which the work of erecting the four buildings was in progress the traffic on the pier continued just as though nothing unusual was going on. Ships came, were loaded to full capacity and sailed away, their places being taken by other ships without delay. The whole job was so efficiently conducted that neither the work of construction nor the daily work on the pier were in conflict with each other. The construction work was done by the Texas Company.

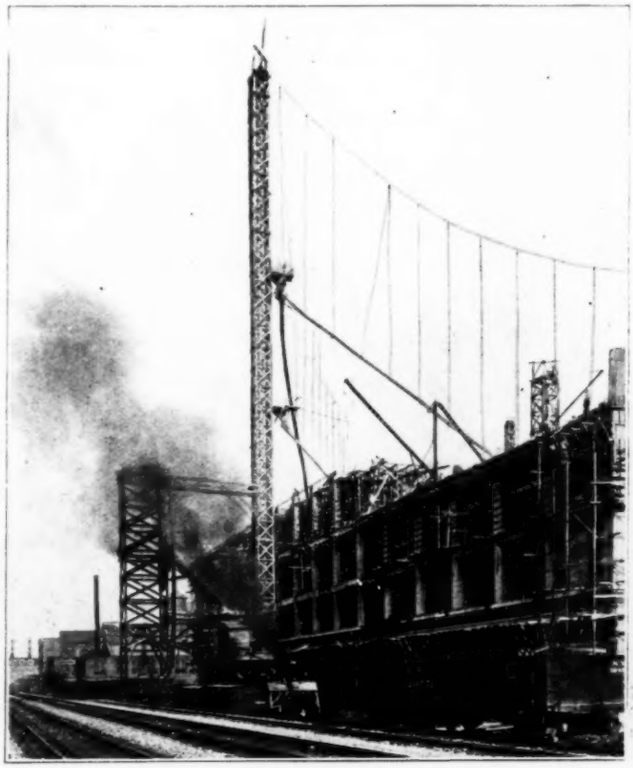
TOWER MATERIAL UNLOADER

Concrete Material Hoisted and Chuted From Cars to Storage Bins

SAND and crushed stone were successfully handled from railway cars to storage bins by means of an unloading tower and chuting apron. This method was used in the construction of three 5-story buildings for the General Electric Co., at Fort Wayne, Ind., by the Wells Brothers Construction Co. of Chicago.

At the left of the high elevating tower and standing over the railroad track nearest the building, as shown in the illustration, is a low tower, connected at the top by a bridge to the elevating tower. In this low tower a 1½ cu. yd. clam shell bucket operated. Sand and stone were delivered in gondola cars under the bucket tower.

The bucket was operated with two lines running over sheaves in the head block and thence to a 2-drum hoisting engine. When the loaded bucket was elevated to a point above the top of the apron, the free side of the apron was lifted, and the bucket discharged on an inclined plane the material rolling down into the adjacent bins. This apron was raised by means of a cable bridle running over sheaves and to a winch head on the hoisting engine.



TOWER UNLOADER AT WORK

This proved to be an economical method of unloading material, as one bucket could unload 20 cars a day.

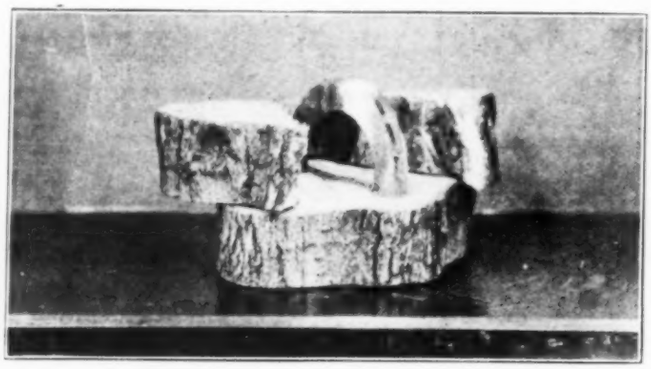
A mixer, with batch hopper, was installed beneath the bins and the mixed material elevated in a hoist bucket, thence through chutes into the forms on the different floors.

There were 1,950 cu. yd. of concrete per floor, and the average time for making the forms and pouring each floor was 10 days.

To operate the clam shell unloader, 4 men cleaning up in cars, 1 engineer and 1 fireman were required. Also there were 2 men operating the mixer, 2 men feeding in cement, 1 man to operate and discharge from the hopper, and 5 men handling the chute and puddling the concrete into the forms.

THE GREAT HORSESHOE MYSTERY

Contractors are always disturbing the face of nature and every now and then they turn up some oddity like that in the accompanying photograph. It is a horseshoe which was discovered imbedded in the heart of a tree recently cut near Hartwell, Ohio. The photograph was sent to SUCCESSFUL METHODS by one of its readers.



HOW DID IT GET THERE?

IOWA ADOPTS NEW NUMBERING SYSTEM FOR ITS THROUGH ROUTES

Iowa has fallen in line with Wisconsin and Minnesota, in adopting a specific system of numbering her important through tourist routes. So far as possible the same numbers used in Minnesota and Wisconsin will be applied to the same routes in Iowa. The Jefferson Highway, for which is No. 1 in the Minnesota system of numbering, will be No. 1 through Iowa; the Lincoln Highway, which is now 6 in Illinois, will be No. 6 in Iowa; the River-to-River Road, famous as the first tourist route in the United States to be maintained by tourist road organizations, will be No. 7; its rival, the White Polo Road, will be No. 2 and the Hawkeye Highway, which is now a section of the Grant Highway, will become No. 5. It is the expectation that every tourist road will be supplied with disks bearing these numbers.

THE ALLIED MACHINERY CENTER

New Showroom Opened in New York by Group of Progressive Manufacturers

A CONSTRUCTION machinery showroom in which the products of more than a dozen manufacturers are on permanent display was opened recently at 141 Centre St., New York City. This showroom, christened the Allied Machinery Center, is conveniently located within a short block of two of New York's subways and undoubtedly will be the first objective of the foreign and domestic buyers of construction machinery as soon as they set foot on Manhattan Island.

To mark the opening of the showroom a luncheon was held which was attended by a large number of men prominent in American business, as well as representatives of foreign countries. The chief speakers were: Joshua W. Alexander, Secretary of Commerce of the United States; Walter E. Edge, United States Senator from New Jersey, and George Ed. Smith, president of the Royal Typewriter Company. William C. Redfield, Mr. Alexander's predecessor as Secretary of Commerce, was among the guests.

Secretary Alexander, who for a number of years was chairman of the House Committee on Merchant Marine, pleaded unfamiliarity with his new post and devoted most of his speech to the discussion of the merchant marine and foreign trade, a subject in which he gained considerable experience while serving in Congress. Senator Edge urged the curtailment of loans to European governments and counselled more action in the export field. Both Secretary Alexander and Senator Edge seemed of the opinion that private enterprise ought to be favored as against government control.

The machinery showroom consists of two parts. Most of the equipment is on the ground floor and the offices of the companies are on the second floor. Among the products shown are hoisting machines, trench excavators, various sorts of road construction machinery, including steam and motor rollers and scarifiers, concrete mixers and distributing equipment, loaders and conveyors, sawrigs and shovels, wheelbarrows, gasoline motors, acetylene flare lights, wheeled scrapers, cars and industrial track.

CONSTRUCTION MACHINERY HEADQUARTERS

The World-Wide Guide to the Best Construction Machinery and Service

IN far eastern Tokyo or southern Argentina, in the capitals of the world—New York, London, Paris—at the outposts of civilization this mark is always found.

Wherever construction machinery is in use, Almacoa experts are aiding users to gain the best from the machinery.

World over, this service is the same—always available, available to all. Mark the list of branches shown below. Truly a world organization; identify it by the Almacoa mark.

ALLIED MACHINERY COMPANY OF AMERICA

Cable Address: ALMACOA

51 Chambers Street — New York

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BELGIUM—34 and 36 Rue Melsens, Brussells Allied Machinery Company of America. Cable Address: ALMACOA

BRAZIL—Sau Paulo—Byington & Co. Cable Address: ALTON

CHILE—Iquique. Allied Machinery Company of America. Cable Address: ALMACOA

CHILE—Calle Bandera, 780 Santiago. Allied Machinery Company of America. Cable Address: ALMACOA

CHINA—Tientsin. French Concession, Horne Co., Ltd., 35-37 Rue de Barron Gros. Cable Address: HORNE

CUBA—Havana. Allied Machinery Co. of America Obrapia 23. Cable Address: ALMACOA

ENGLAND—Allied Machinery Co., Limited, 132 Queen Victoria Street, London, E. C.-4. Cable Address: ALYDMACHIN

FRANCE - Paris. Allied Machinery Co. de France 19 Rue de Rocroy. Cable Address: ALMACOA

INDIA—Karachi. L. R. Vinall-Moon. Cable Address: ALMACOA

ITALY—Turin—Allied Machinery Co., Corso Dante 40. Cable Address: ALMACOA

JAPAN—Tokyo—Horne Company, Limited., 67 Takiyama cho, Kyobashi-ku. Cable Address: HORNE

PERU—Lima. Cor. Ortiz & Colonge Streets. Representative, Joaquin M. de Uriarte, Engineer

PORTUGAL—Rue de Alecrim, 10 Lisbon, Monteiro Gomes, Ltd. Cable Address: TRACTORS

SPAIN—Barcelona. Plaza de Calaluna 8. Allied Machinery Company, S. A. E. Cable Address: ALMACOA

A Striking Example

THESE are actual photographs (taken on the field of action) showing in point of work just what the special nickel chrome alloy steel used in all Red Edge Shovels means.

We roll this steel ourselves—and we do it to be sure your Red Edge Shovels will give you the service we promise and you rightly expect.

WYOMING RED EDGE SHOVELS

The WYOMING SHOVEL WORKS

Of Shovel Cost

Wear Costs More than the Shovel

Did you ever stop to figure how much poor shovels cost you? Your shovellers represent a cash outlay just as much as do the shovels they use—it takes a good shovel to make both pay.

Take the material moved per shovel-full. Or the time spent in sharpening the blade or repointing the scoop; consider well these important factors.

The Entire Scoop of Nickel Chrome Alloy Steel

Wyoming Red Edge Shovels are made of nickel chrome alloy steel *all the way back*—a tough, wear resisting steel.

They have toughness and strength—yet are not brittle; our special alloy prevents their splitting, cracking or breaking. This we guarantee for life.

They wear back slowly; always evenly. They hang right; swing easily; cut cleanly. Note, at the left, the load they pick up.

Every Wyoming Red Edge Shovel is backed by an absolute guarantee of satisfaction. The Red Edge, in itself, is your assurance—it is a mark for your protection.

Ask for the complete story of Red Edge construction and the Red Edge performance record-facts which mean money in your pocket. Write for full information.

THE WYOMING SHOVEL WORKS - Wyoming, Pa.
NEW YORK, 165 Broadway

CHICAGO
347 Peoples Gas Bldg.

BOSTON
118 Pearl Street

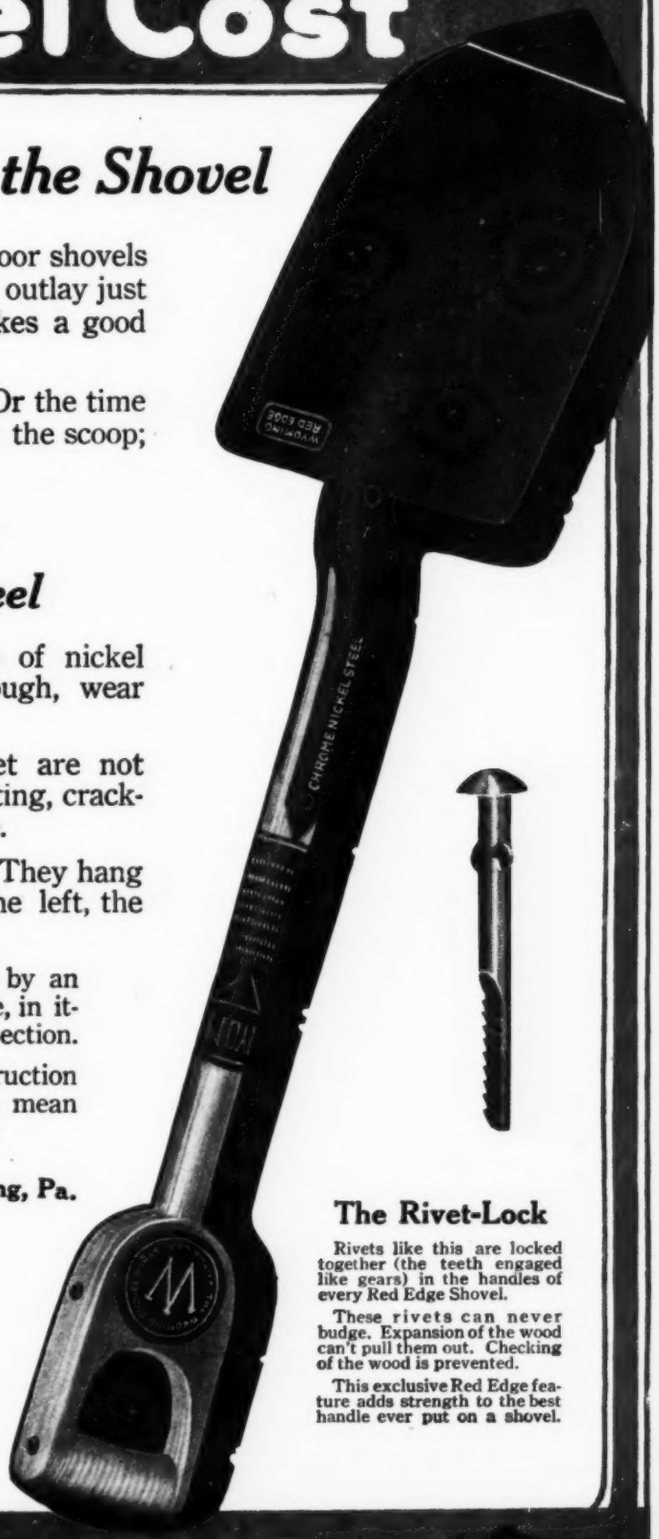
PHILADELPHIA
1234 Commercial Trust Bldg.

ATLANTA
1405 Candler Bldg.

SPOKANE
336 First Avenue

SAN FRANCISCO
268 Market St.

ALMACO — EXPORT DEPARTMENT ALLIED MACHINERY COMPANY OF AMERICA — ALMACO



The Rivet-Lock

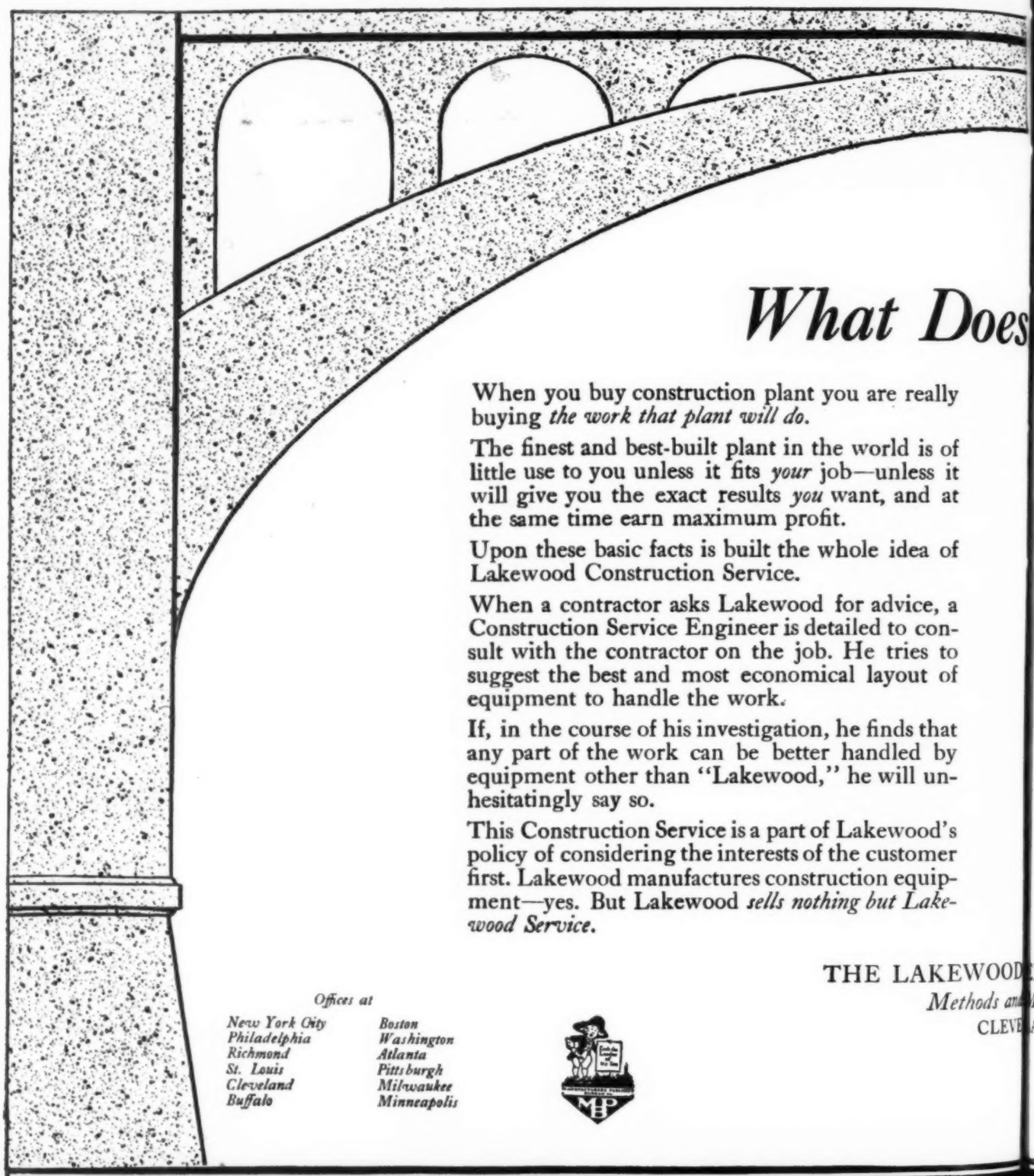
Rivets like this are locked together (the teeth engaged like gears) in the handles of every Red Edge Shovel.

These rivets can never budge. Expansion of the wood can't pull them out. Checking of the wood is prevented.

This exclusive Red Edge feature adds strength to the best handle ever put on a shovel.

The WYOMING SHOVEL WORKS

MANUFACTURERS' PUBLICITY BUREAU Inc. MPB



What Does L

When you buy construction plant you are really buying *the work that plant will do.*

The finest and best-built plant in the world is of little use to you unless it fits *your* job—unless it will give you the exact results *you* want, and at the same time earn maximum profit.

Upon these basic facts is built the whole idea of Lakewood Construction Service.

When a contractor asks Lakewood for advice, a Construction Service Engineer is detailed to consult with the contractor on the job. He tries to suggest the best and most economical layout of equipment to handle the work.

If, in the course of his investigation, he finds that any part of the work can be better handled by equipment other than "Lakewood," he will unhesitatingly say so.

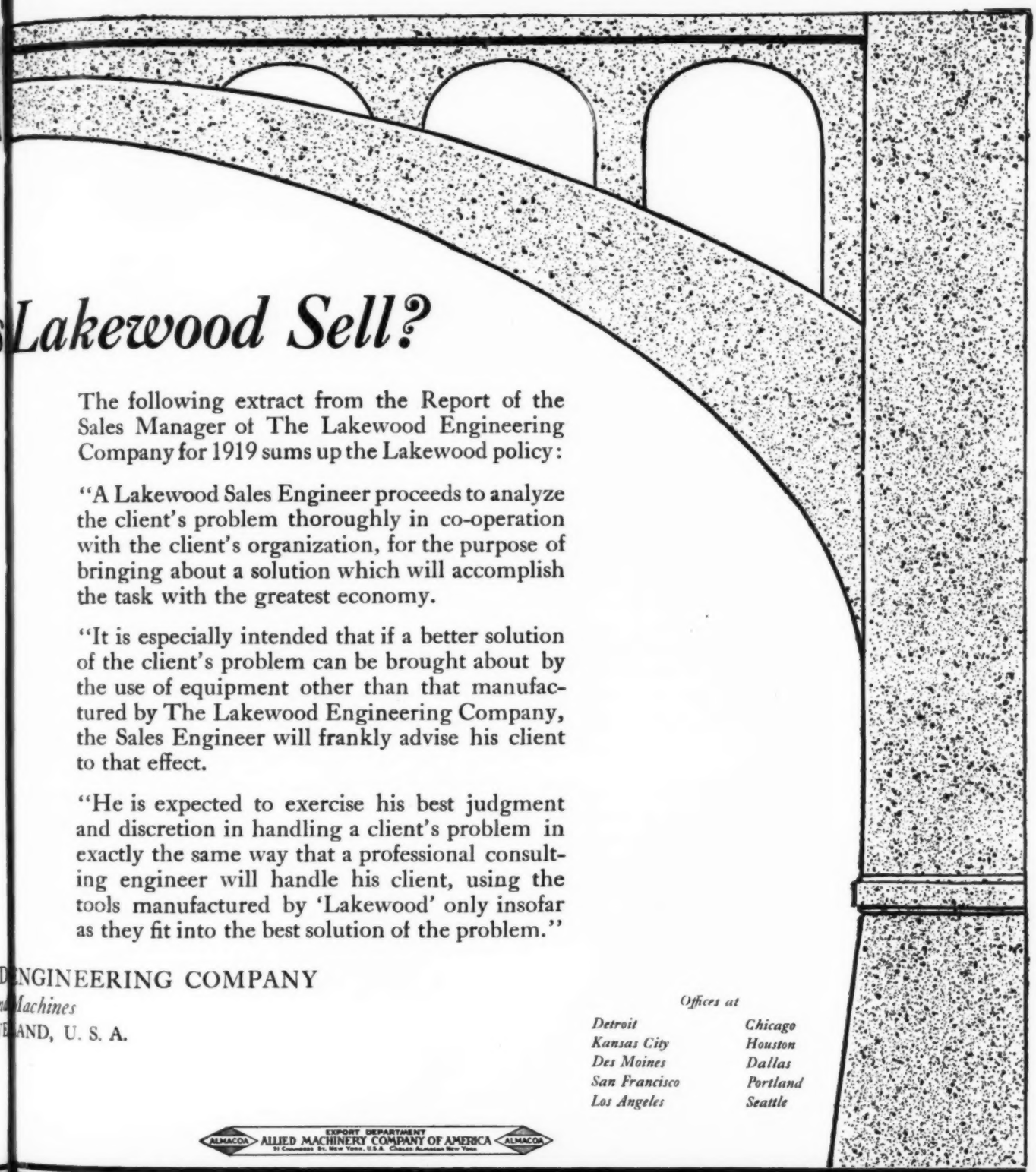
This Construction Service is a part of Lakewood's policy of considering the interests of the customer first. Lakewood manufactures construction equipment—yes. But Lakewood *sells nothing but Lakewood Service.*

THE LAKEWOOD NGI
Methods and Machi
CLEVELAND,

Offices at

New York City — *Boston*
Philadelphia — *Washington*
Richmond — *Atlanta*
St. Louis — *Pittsburgh*
Cleveland — *Milwaukee*
Buffalo — *Minneapolis*

Lakewood Road Co



oes Lakewood Sell?

The following extract from the Report of the Sales Manager of The Lakewood Engineering Company for 1919 sums up the Lakewood policy:

"A Lakewood Sales Engineer proceeds to analyze the client's problem thoroughly in co-operation with the client's organization, for the purpose of bringing about a solution which will accomplish the task with the greatest economy.

"It is especially intended that if a better solution of the client's problem can be brought about by the use of equipment other than that manufactured by The Lakewood Engineering Company, the Sales Engineer will frankly advise his client to that effect.

"He is expected to exercise his best judgment and discretion in handling a client's problem in exactly the same way that a professional consulting engineer will handle his client, using the tools manufactured by 'Lakewood' only insofar as they fit into the best solution of the problem."

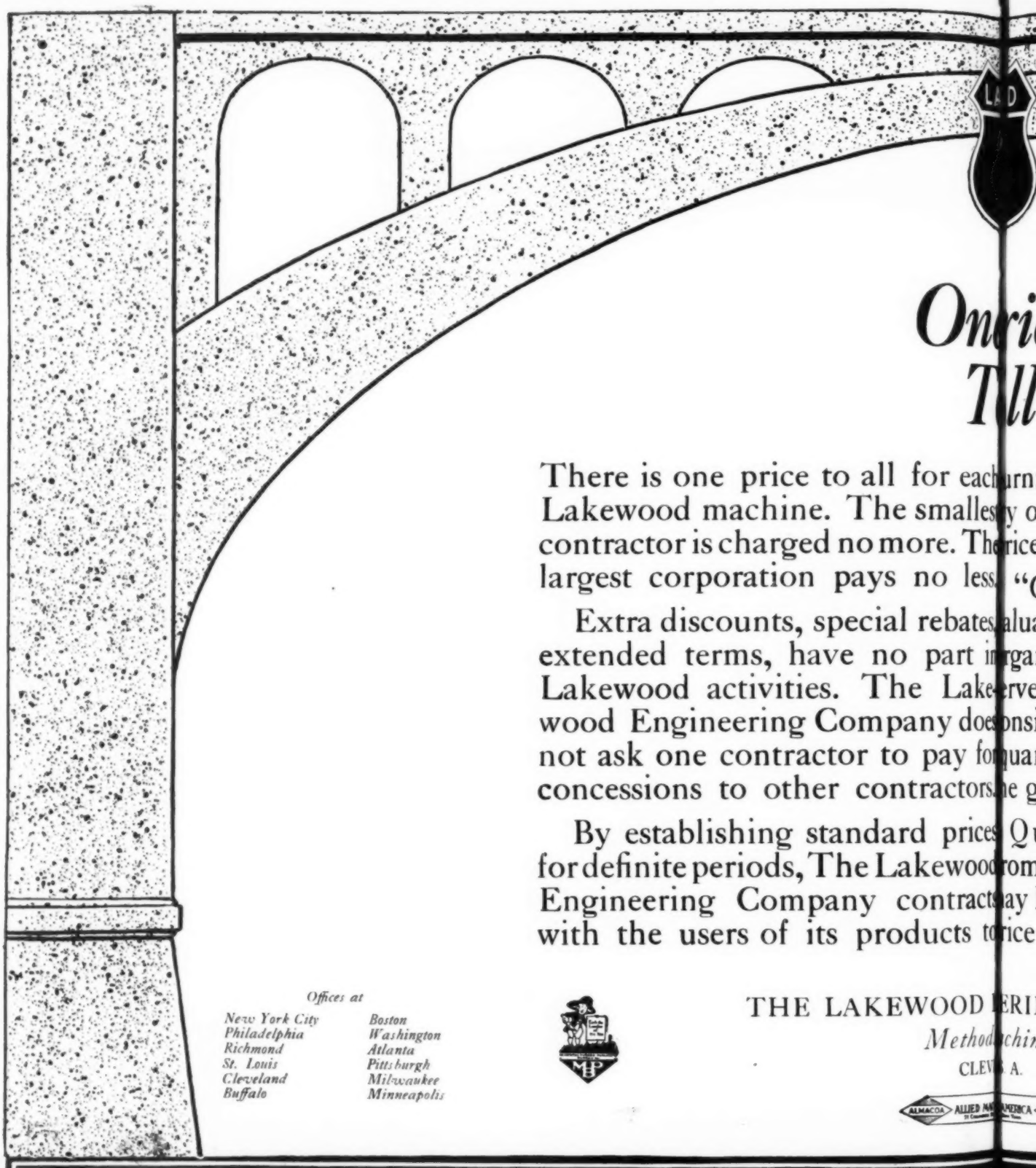
VOOD NGINEERING COMPANY
ods and Machines
CLEVELAND, U. S. A.

Offices at

Detroit	*Chicago*
Kansas City	*Houston*
Des Moines	*Dallas*
San Francisco	*Portland*
Los Angeles	*Seattle*

EXPORT DEPARTMENT
ALMACOA ALLIED MACHINERY COMPANY OF AMERICA ALMACOA

onstruction Plant



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Till

There is one price to all for eachurn
Lakewood machine. The smalles y o
contractor is charged no more. Thrice
largest corporation pays no less. "

Extra discounts, special rebates,alua
extended terms, have no part inrga
Lakewood activities. The Lake-erve
wood Engineering Company doesonsi
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By establishing standard prices Qu
for definite periods, The Lakewoodrom
Engineering Company contractsay
with the users of its products torice

Offices at

New York City	*Boston*
Philadelphia	*Washington*
Richmond	*Atlanta*
St. Louis	*Pittsburgh*
Cleveland	*Milwaukee*
Buffalo	*Minneapolis*

THE LAKEWOOD ERI
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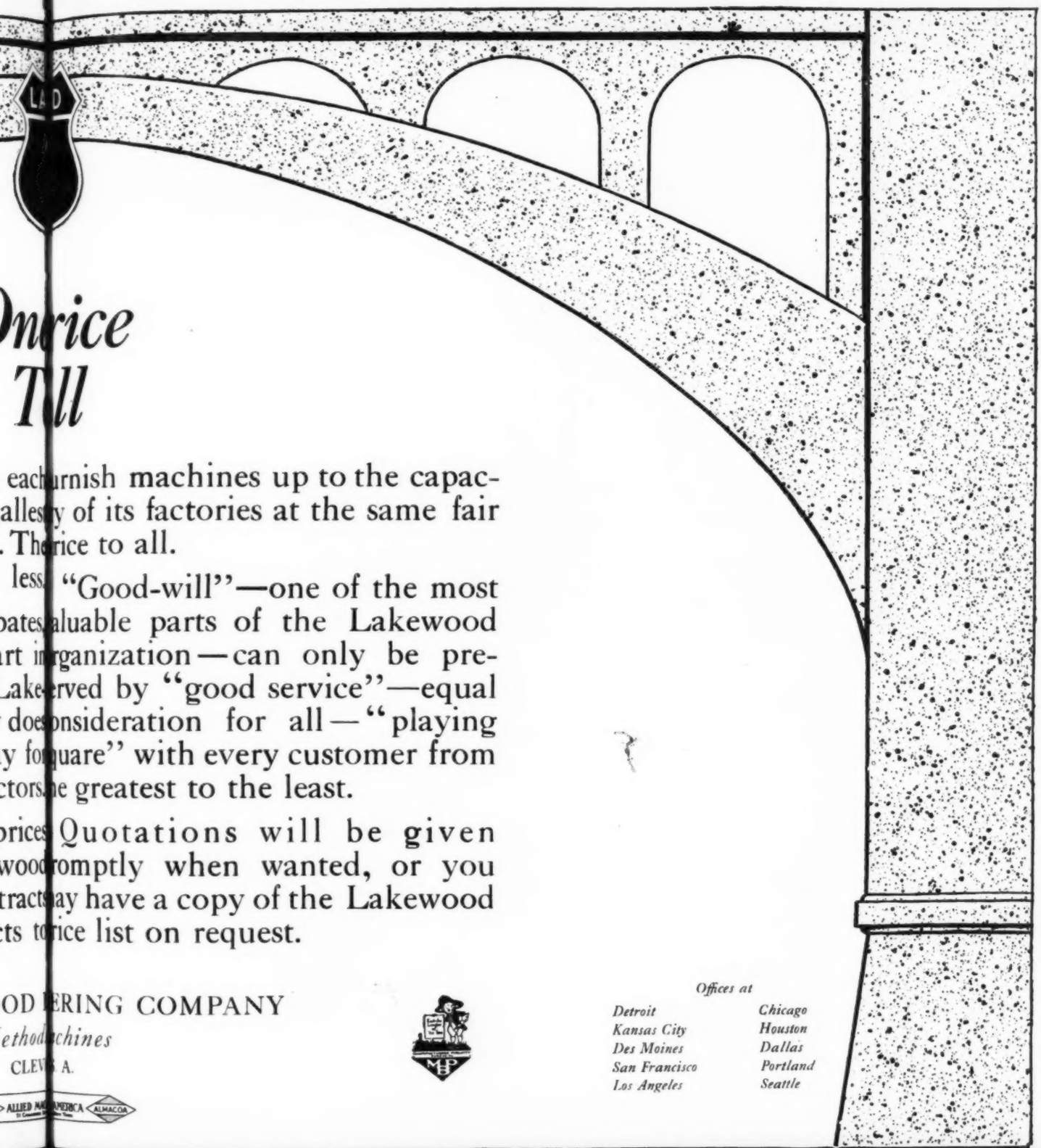

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...less. "Good-will"—one of the most ...pates aluable parts of the Lakewood ...rt in ganization—can only be pre-...Lake erved by "good service"—equal ...does nsideration for all—"playing ...y fo quare" with every customer from ...ctors he greatest to the least.

...prices Quotations will be given ...wood romptly when wanted, or you ...tracts ay have a copy of the Lakewood ...cts to ice list on request.

...OD ERING COMPANY
...ethod achines
CLEV A.

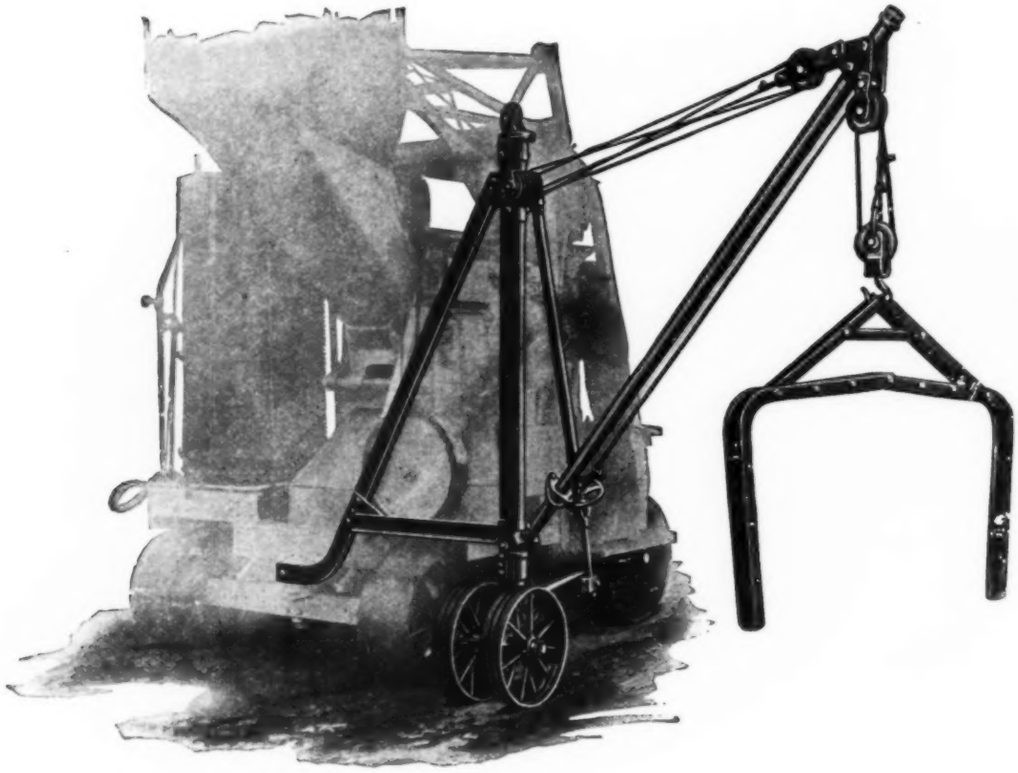
ALLIED MA ERICA ALMACO

Offices at

Detroit	*Chicago*
Kansas City	*Houston*
Des Moines	*Dallas*
San Francisco	*Portland*
Los Angeles	*Seattle*

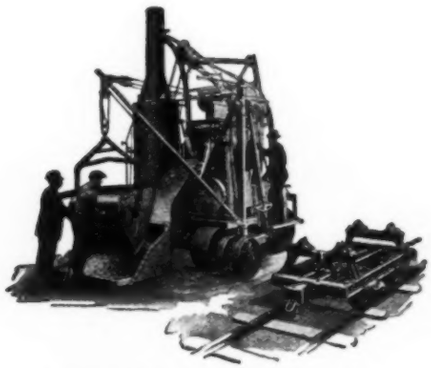
...ruction Plant

First Lakewood Developed



The Weight of the Skip is the Lifting Force

Bail Attached to Car Body



Complete Batch Dumped into Skip

Lakewood Cons

Road Building Methods

— *THEN the Machines Were Perfected to Increase the Productive Ability of Labor*

MUCH of the work that Lakewood has done in the road construction field has been in developing methods that would insure a reasonable profit for the contractor and the completion of contracts on scheduled time.

After developing the *methods* and overcoming the obstacles always encountered in developing and standardizing, Lakewood undertook to design the equipment that would make possible the use of the methods.

Lakewood's success in producing machines that increase the productive ability and earning capacity of labor can be illustrated by many examples:—the Road Finishing Machine—the Subgrader—the Complete Batch Cars—Tunnel Storage of Material—the Batch Transfer, etc.

Consider this one—the Batch Transfer—as indicating the thorough way in which Lakewood analyzed and solved the problem.

The Lakewood Batch Transfer on Lakewood-Milwaukee Paving Mixers is easily adjusted so that the mast leans toward the charging skip just enough to make the heavy batches swing over the skip by gravity. Thus the men handling batches the Lakewood Way work throughout the day with higher efficiency—do more work and are better satisfied. They are, also, more inclined to remain in the contractor's employ, with a resulting decrease in labor turnover.

The contractor's investment is reduced considerably by the economical design of the Lakewood Batch Transfer. With this device the weight of the descending charging skip raises the loaded batch boxes. No extra hoist or crane is required to do this work. The contractor is saved this expense.

The load of the Batch Transfer is carried on two separate wheels, thus relieving the mixer of an eccentric load that would otherwise result. This arrangement also permits quick adjustment of the mast to the desired working position, even though the mixer may be tilted slightly due to the crown of the road.

Flexibility was also considered when the Lakewood Batch Transfer was created. The device may be attached to either side of the Lakewood-Milwaukee Paver. It works equally well on either side of the road.

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CLEVELAND, U.S.A.

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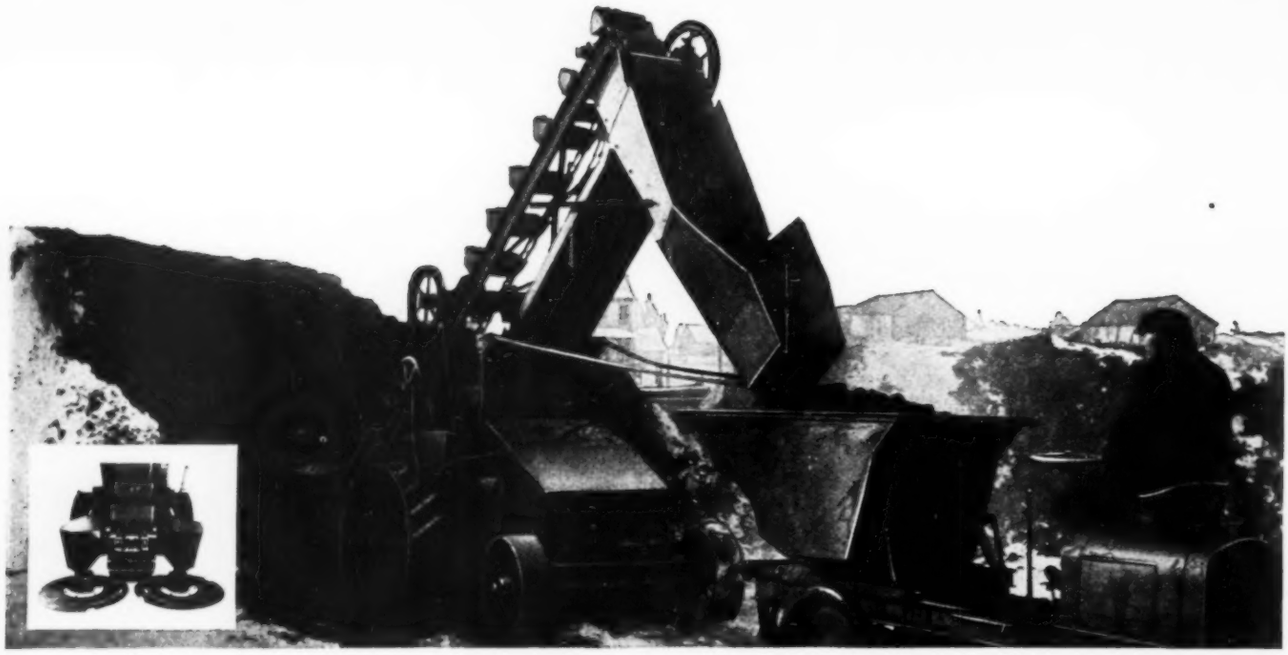

B-G Self-Feeding Bucket Loader

THE B-G Loader needs material and power—nothing else. It makes no difference where the job is. Always ready to work at loading all kinds of bulk material—coal, sand, stone, gravel, etc. Shovelers replaced—saving time, money and labor. Loads over one cubic yard per minute—and this for day after day. Especially on road work with materials on the subgrade, the most efficient and greatest profit-making machine you can buy is a B-G Self-Feeding Bucket Loader.

Tell us how you load your wagons, trucks, cars or wheelbarrows. Our sales engineers will suggest equipment and methods —no charge. Catalog B tells about this machine in detail. Do you want it?

The rotary disc feeder alone makes this the machine you need. As the loader eats into the pile two large, flat steel discs cut under the material and carry it to the moving buckets — keeping them always filled. Perfectly safe and reliable. It's patented — there's nothing like it. And this is only one of its many features.

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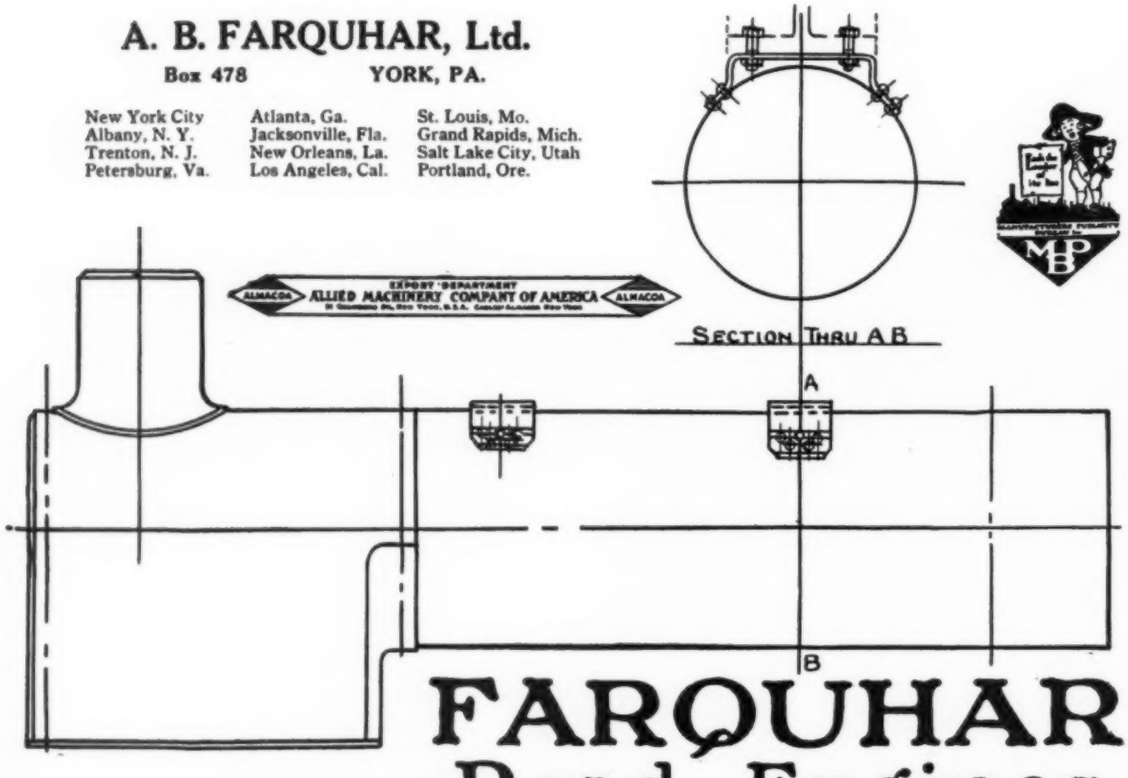

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